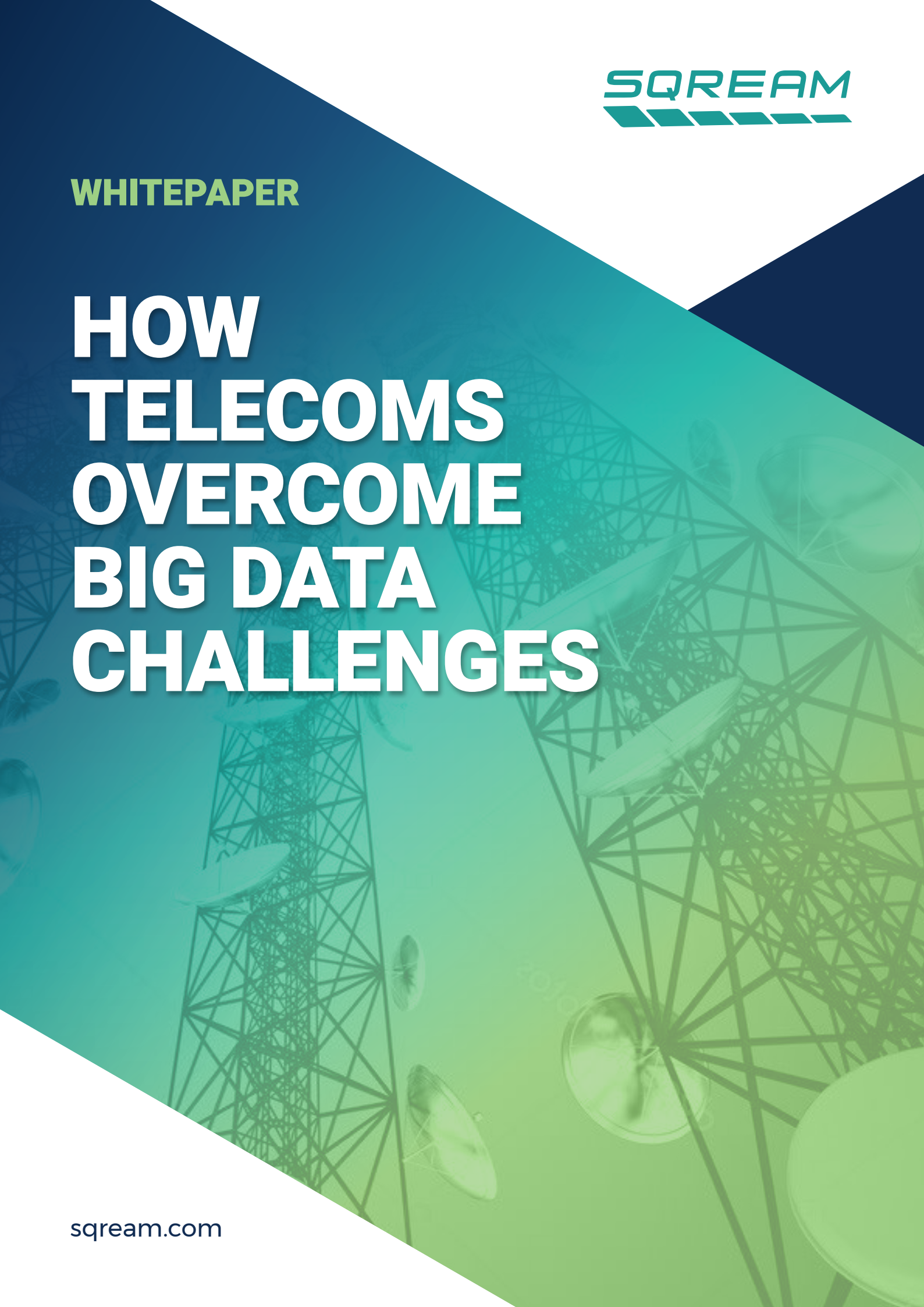
SQREAM

WHITEPAPER

HOW TELECOMS OVERCOME BIG DATA CHALLENGES



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INTRODUCTION

Mobile services subscribers use their connected devices for everything from voice, text, video, gaming, and more, creating enormous and fast-growing quantities of data. While this data carries great potential, telecoms bear the difficult challenge of storing, navigating, and turning these huge data stores into actionable insights. Those telecom organizations that succeed in unlocking the intelligence gems hidden in these treasure troves of data often find themselves better poised to compete in an increasingly cluttered and competitive market.

ANTIQUATED DATA ARCHITECTURES MEET MODERN TELECOM DATA LOADS

The challenges faced by these organizations are technological as well as regulatory, both of which have direct business ramifications. For starters, collecting and managing data from multiple silos is a challenge on its own. However, when the work is being executed on antiquated data architectures that were not designed to handle such massive data, data management and preparation often turn into a particularly complex and frustrating endeavor.

The reality is that finding meaningful patterns hidden in the massive data moving through the pipeline is no easy feat. Providing the segmented data needed to train AI models or feed applications that drive business can be painstakingly slow and often infeasible using legacy technology. As a result of inefficiencies in the data pipeline and other technological restrictions, the amount of data that can be analyzed in practice is only a subset of the entire data store – leaving many critical insights out of reach.

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EMERGING DATA REGULATIONS COMPOUND THE COMPLEXITY

Compounding the challenge are emerging data governance requirements that dictate how data must be protected and how it can be used. When we think of data protection, the European Union's General Data Protection Regulation, GDPR generally comes to mind. In fact, telecoms and communication providers need to comply with a plethora of regulations such as the California Consumer Privacy Act (CCPA), the Federal Trade Commission's Children's Online Privacy Protection Act (COPPA), China's Ministry of Industry and Information Technology's (MIIT) Personal Information Security Specification, Singapore's Personal Data Protection Act, and New York State's Stop Hacks and Improve Electronic Data Security Act (SHIELD). Each regulation has its own guidelines for data management, compliance, reporting and auditing.

So, while telecoms are hugely responsible for the digital connected world we live in, they are also fighting to survive in a highly competitive, highly regulated, low-margin, services-based industry, where past investments are often trapped in traditional business models.

This paper explores these challenges and discusses how best-performing telecoms are finding ways to transform their massive data stores from a major burden to a business driver, enabling the delivery of critical insights faster. It will highlight how successful telecoms are updating their technological infrastructure for better data management, to be able to expand the usage and analysis of network and customer data for significantly increased competitive advantage with better customer offerings, quality of service, and operational support.

CHALLENGE: SECURING CUSTOMER LOYALTY IN AN ERA OF HYPER COMPETITION

In the fast-growing telecom industry, companies are challenged to cultivate customer loyalty, as staunch competition makes it harder to stand out and connect with new and existing customers. Customers today demand products and services that are customized to their needs and requirements. They want seamless and reliable engagement across a variety of platforms and channels.

Additionally, as the subscriber level grows into the multi-millions, operational support services like service configuration, premium service and order fulfillment, customer care, and billing are becoming increasingly complex. In order to compete, telecom companies must invest in technology and analytics that enable them to provide insight-driven experiences, and personalized services and solutions to cement customer loyalty and drive long-term growth. They must find new ways to understand the customer that extends beyond existing core products and services, and across channels.

> ***Best-performing telecoms are finding ways to transform their massive data stores from a major burden to a business driver, enabling the delivery of critical insights faster.***

Telecom companies have the data needed to provide these customized products and services. What they are often lacking is the means with which to efficiently access and analyze the data, so that they can effectively use it to keep customers satisfied and loyal.

CHALLENGE: PROVIDING HIGH QUALITY AND RELIABLE DATA AND VOICE SERVICES

One of the necessary components for competing in today's telecom market is the ability to provide consistently high quality, reliable, and affordable data and voice services. Network problems leading to reduced quality of voice and data services, disconnected calls, and internet service frustrate and irritate customers, resulting in the loss of customers and revenue. Using insights from collected network data can allow operators to provide more reliable service by enabling the diagnosis of complex and often hidden issues that can directly reduce service quality.

> ***Telecoms must find new ways to understand the customer that extends beyond existing core products and services, and across channels.***

But traditional solutions for identifying problems are often time-consuming, expensive and incomplete. What is needed is technology that enables the analysis of raw data from disparate network sources, and the ability to accelerate the data collection, preparation and analysis. This capability would significantly reduce the time it takes to identify network quality issues and sporadic overload that lead to hard to uncover anomalies.

CHALLENGE: PREPARE FOR THE IMPACT OF INTERNET OF THINGS WHICH WILL BOOST THE DATA ONSLAUGHT

Another challenge waiting in the wings for telecoms and ISPs is the impact of Internet of Things (IoT) that is leading to explosive growth in connected devices. This growth generates billions and trillions of new data sources, and is expected to increase the data to be handled by networks to zettabytes per year.

While the IoT revolution will help telecoms create value in new ways, with new products and services for changing customer behavior, they will need to provide increasingly sophisticated services going forward. To keep up with demand for IoT-related connectivity and data, telecoms must adopt new strategies. Driven by innovation, and with the opportunity to provide long term cost efficiencies, IoT is poised to create new opportunities for telecoms, enable new sources of revenue, and help solve many new-world problems.

> ***Telecoms must be ready with a data analytics infrastructure capable of handling enormous amounts of IoT data from connected devices.***

But to take advantage of this new "things" reality with IoT as a major source of data, telecoms must be ready with a data analytics infrastructure capable of handling enormous amounts of IoT data from connected devices. Legacy infrastructure and data warehouses designed for a different era of data can't keep up with the pace of IoT data growth. They can't support the rapid ingest, preparation, and analysis of these massive data stores that is needed in order to be able to extract the valuable insights that will be available from these new information sources.

SQREAM DB PROVIDES BETTER INSIGHTS, FASTER

With the emergence of global standards for high-speed 5G and 4G networks, the longstanding ability to differentiate products and services based on handset selection and network quality has all but disappeared. To reduce churn and improve customer satisfaction, it is imperative for telecoms to embrace advanced data analytics' solutions.

Telecoms often have disjointed data silos for network, customer profiles, marketing, billing, and other lines of business. These silos require complex data management, lengthy data preparation tasks, and never-ending queries and reports, all of which place a heavy burden on the organization. Data teams need a single, readily-accessible data source that will empower them to understand the operations of business.

SQream DB is a modern data analytics solution that consolidates data sources and empowers data and business professionals to achieve crucial insights. SQream DB accommodates terabytes to petabytes of data, with a fully featured SQL interface, superior scaling, and a robust architecture based on accelerated hardware. Best of all, data sources can be combined in one smart data warehouse.

BUILT GROUND-UP FOR HIGH-PERFORMANCE ANALYTICS

SQream DB was created from scratch to empower data consumers to analyze and freely explore their data. Harnessing the raw brute-force power and high throughput capabilities of the GPU, SQream DB is a powerful SQL data warehouse designed for constantly growing telecom data. SQream DB's optimized columnar storage system supports heavy analytic operations like joins, aggregations, summarizations, and sorting of massive datasets. By easily correlating massive volumes of customer data, SQream DB facilitates comprehensive cross-company insights, for a 360 customer view. This enables telecoms to create more specialized market segments, tailor customer experience, predict support calls, improve payment recovery, and reduce churn.

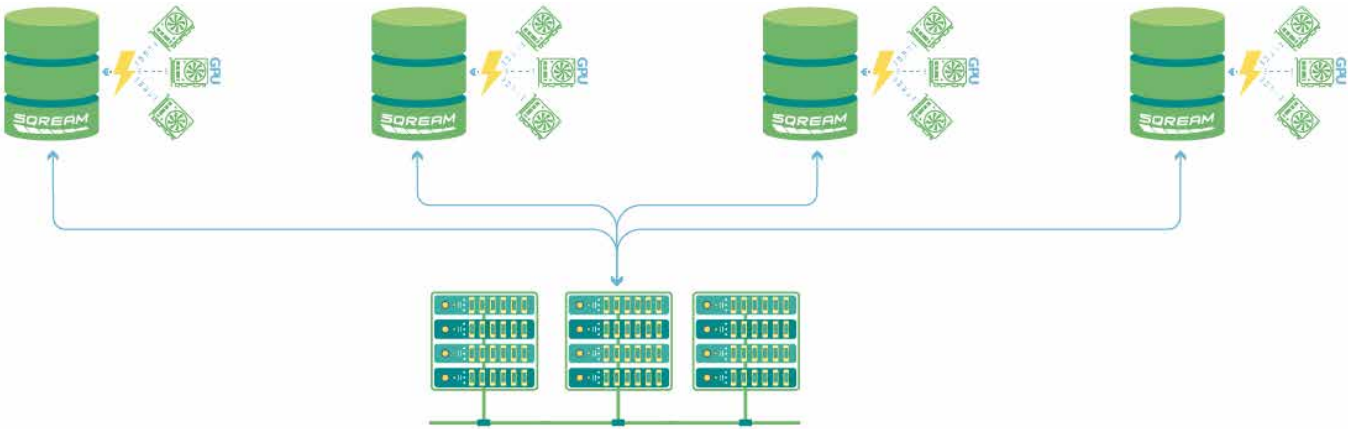


Figure 2 - SQream DB can scale both compute and storage separately, maximizing flexibility.

Every SQream DB instance has full access to all data in the persistent storage layer, simplifying data management, and enabling lines of business to access of the company's data. SQream DB's architecture further boosts performance by transparently and automatically caching data, which can be re-used by other SQream DB instances as needed. The system scales storage and compute independently, providing telecoms with the precise storage and compute resources for their dynamic needs.

SQream DB contains hundreds of optimizations and automations designed to let businesses focus on data, rather than data management.

Unlike traditional databases that require a team of administrators to finesse and manually tune processes, maintain indexing, update views and projections, SQream DB was designed for frequently changing, modern workloads. Built to handle worst-case scenarios, it is optimized for the huge datasets common in telecom organizations, where typical database optimizations struggle.

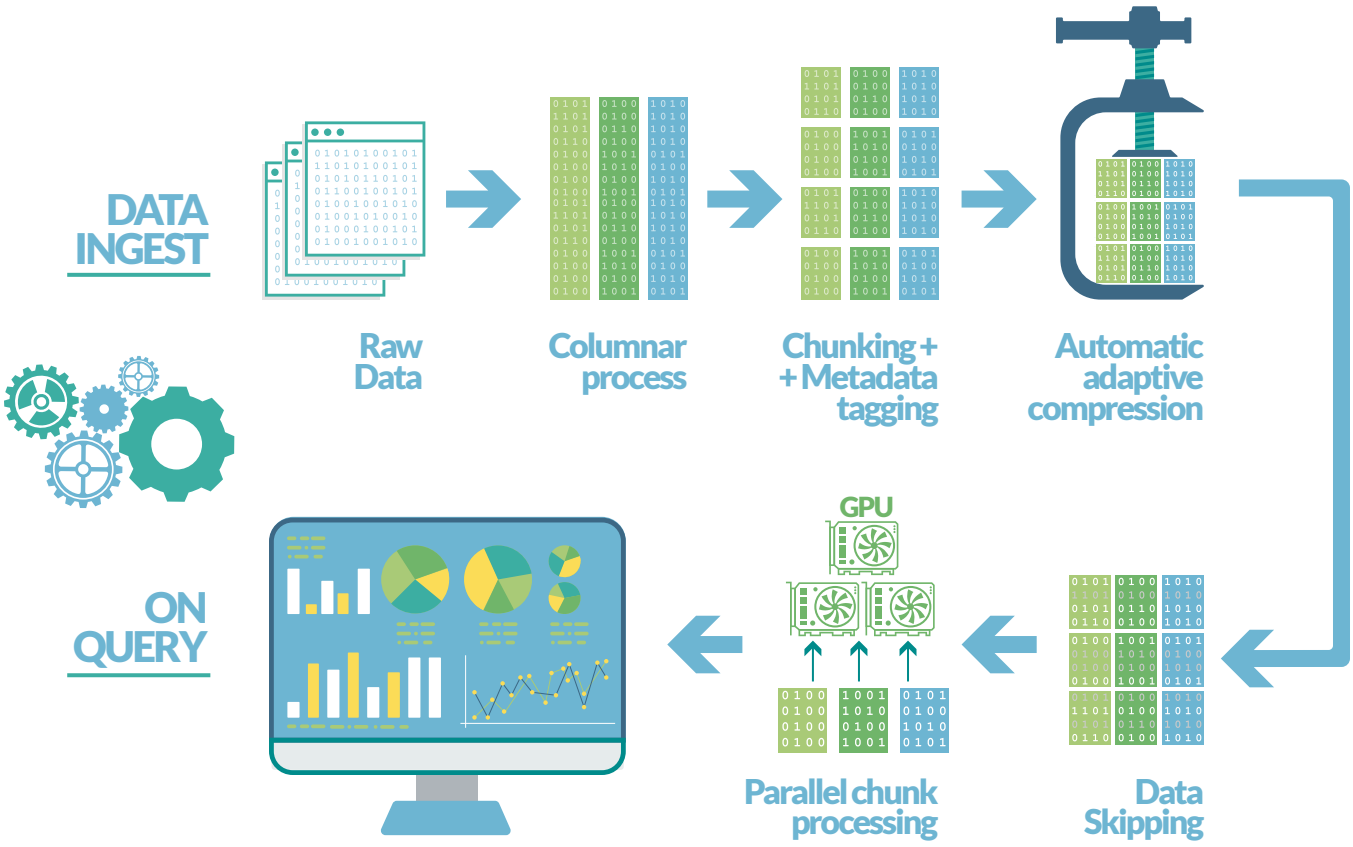
RAPID DATA INGEST AND ANALYSIS OF RAW DATA

Automatic tuning is a key enabler for data analysis without intermediate steps, and is a major part of SQream DB. The brute power of the GPU allows SQream DB to analyze data immediately after load. This is in stark contrast to most data warehouses, which require time-consuming and insight-limiting processes like indexing, cubing, projecting, etc.

During data ingest, SQream DB automatically and transparently prepares all data for immediate, fast analysis – with no user intervention required. This characteristic is especially well-suited for time-series data, including XDRs (CDRs, IPCDRs, etc.).

One of the most common tasks for any analytics database is loading data from an external source. SQream DB ingests up to 3.5 TB per hour per GPU from a variety of sources, either directly from flat files like CSV or Parquet, or through a variety of industry accepted ETL tools. It can also read data directly from external sources using the external table syntax, avoiding premature data loading.

It is common for SQream DB to provide the analytics database, where Apache Kafka serves as the messaging queue system, and Apache Spark provides transformations. In such installations, SQream DB will be the layer bridging the applications, with persistence store for analysis.



HOW TWO TELECOMS USE BIG DATA TO DRIVE BUSINESS

The combination of features designed for ad-hoc querying has proven attractive for telecoms seeking more insights from their data. SQream DB is successfully deployed in telecoms around the world, across different lines of business – in marketing, call detail record analysis, network engineering, and even for value added services.

CELLCOM IMPROVES QUALITY OF SERVICE

With revenue from calls and internet activity decreasing across the industry, Cellcom, Israel's leading telecom operator, was under pressure to deliver a better product while keeping costs down. However, the company faced network problems that frustrated customers and rippled into the organization's customer support and network teams.

The company's existing solution involved manually performing analytics on week-old data, identifying technical issues only after they had already escalated. The option of installing network probes at the 4G cell site's eNodeB would have cost millions of dollars.

Cellcom chose SQream DB as a cost-effective and highly efficient network analysis solution. A process was established to collect raw log data from eNodeBs, which is then parsed and converted to a relational format inside SQream's data warehouse. A SpotFire-based solution was implemented that allowed engineers to identify and track throughput, drops, and anomalies in near real-time.

Within hours, they identified a host of previously unknown issues, including a high drop-rate caused by a hard handover from the macro-cell to the femto-cell. Following the discovery, Cellcom was able to promptly fix the issue, reducing the drop count by 90%. With SQream DB, Cellcom can now identify network issues before they escalate, increasing engineer's productivity and restoring customer satisfaction.

"We saw a tremendously cost-effective opportunity to obtain comprehensive analytic abilities we didn't have before SQream, required to continuously improve our network service for our customers."

RF Group Leader,
Cellcom

AIS ENHANCES CUSTOMER EXPERIENCE

In the highly competitive local market, Thailand's leading mobile network operator, AIS, strives to differentiate itself by delivering an exceptional customer experience. To this end, the company wanted to translate billions of records of siloed data into improved network management and customer service.

AIS's existing Greenplum solution was unable to support their growing volumes of data and required hours of data preparation that restricted drill-down. The company's BI users needed fast and cost-effective access to massive volumes of customer and CDR data.

AIS implemented SQream's data warehouse to accelerate analytics and enable new customer insights. With SQream DB, AIS analyzes a much larger percentage of their data store, achieving a detailed picture of their customers rather than aggregated overview. Performing deeper drilldowns and faster competitive analysis, the company's data and business teams can better target and enrich their customer offerings.

"SQream DB helps us to keep pace with rapidly increasing data usage, and translate that data into real benefits for our customers."

Suppachai Panichayunon,
Head of Solution Design and Architect,
AIS

SQREAM
GPU DATA WAREHOUSE

ABOUT SQREAM

Visit sqream.com to learn more about how telecom organizations around the globe turn their data challenges into business opportunity.

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